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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,063	03/31/2005	Philippe Meunier-Beillard	BE02 0027 US	6267

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PHILIPS ELECTRONICS NORTH AMERICA CORPORATION  
INTELLECTUAL PROPERTY & STANDARDS  
1109 MCKAY DRIVE, M/S-41SJ  
SAN JOSE, CA 95131

EXAMINER

ESTRADA, MICHELLE

ART UNIT PAPER NUMBER

2823

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary****Application No.**

10/530,063

**Applicant(s)**

MEUNIER-BEILLARD ET AL.

**Examiner**

Michelle Estrada

**Art Unit**

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 17-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Applicant's arguments, filed 7/13/06, with respect to the rejection(s) of claim(s) 1 under Kong et al. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Coleman and Klumpp et al.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Coleman (5,155,062).

Re claim 1, Coleman discloses depositing an epitaxial layer based on Group IV elements, silicon carbide, on a silicon substrate by Chemical Vapor Deposition, and including employing nitrogen as a carrier gas (Col. 1, lines 35-45).

Re claim 2, Coleman discloses forming an epitaxial layer based on at least one of the following silicon and carbon.

Re claim 3, Coleman discloses wherein the epitaxial layer comprises  $\text{Si}_{1-y}\text{C}_y$ .

Re claim 6, Coleman discloses wherein the epitaxial layer comprises a silicon epitaxial layer.

Claims 1-3, 6, 8, 17 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Klumpp et al. (non-patent literature).

Re claim 1, Klumpp et al. discloses depositing an epitaxial layer based on Group IV elements, silicon carbide, on a silicon substrate by Chemical Vapor Deposition, and including employing argon as a carrier gas (abstract).

Re claim 2, Klumpp et al. discloses forming an epitaxial layer based on at least one of the following silicon and carbon.

Re claim 3, Klumpp et al. discloses wherein the epitaxial layer comprises  $\text{Si}_{1-y}\text{C}_y$ .

Re claim 6, Klumpp et al. discloses wherein the epitaxial layer comprises a silicon epitaxial layer.

Re claim 8, Klumpp et al. discloses wherein the depositing is carried out at a temperature of about 450 °C-1000 °C, having a range that overlaps being less than 600 °C.

Re claim 17, Coleman discloses wherein the depositing is carried out at a temperature of about 450 °C-1000 °C, having a range that overlaps being less than 600 °C.

Re claim 20, Coleman discloses wherein the depositing is carried out at a temperature of about 450 °C-1000 °C, having a range that overlaps being less than 600 °C.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coleman as applied to claims 1-3 and 6 above, and further in view of Kaeppler et al. (WO 01/14619).

Re claims 4 and 5, Coleman does not disclose wherein the epitaxial layer comprises a SiGe epitaxial layer.

Kaeppler et al. disclose the deposition of a SiC or SiCGe semiconductor layers by means of a CVD (Abstract).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Coleman and Kaeppler et al. to enable the semiconductor material of Coleman to be the same according to the teachings of Kaeppler because one of ordinary skill in the art would have been motivated to look to alternative suitable materials for the disclosed semiconductor formation step of Coleman and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07. Furthermore, Kaeppler et al. disclose SiCGe as a suitable material to be deposited by CVD.

Re claim 5, Kappeler et al. disclose wherein the epitaxial layer comprises SiGeC.

Claims 7, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coleman in view of Kaeppler et al. as applied to claims 4 and 5 above, and further in view of Kobayashi et al. (non-patent literature).

Re claims 7, 18 and 19, The combination does not disclose the method carried out at a temperature of less than about 600 °C, and using hydrogen as the carrier gas.

Kobayashi et al. disclose depositing an epitaxial layer based on Group IV elements (Ge) on a silicon substrate by CVD, and including employing hydrogen or argons as a carrier gas (abstract); wherein the CVD process is carried out at 350 °C, which is less than 600 °C.

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Coleman, Kaeppler et al, and Kobayashi et al. to enable the CVD temperature step of the combination to be performed according to the teachings of Kobayashi et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed CVD temperature step of the combination and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07. Furthermore, at this temperature you will obtain high-quality heterostructures, epitaxial growth selectivity is perfect and the nucleation is controlled (See Introduction of Kobayashi et al.).


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Michelle Estrada  
Primary Examiner  
Art Unit 2823